Patent Claims

1.) Process for the manufacture of spraying, conversion, punching and/or casting tools as well as prototypes starting out from models characterised by the steps of:
   i. Roughening of the surface of the model without chemical pretreatment of the surface of the model;
   ii. Applying an intermediate layer of copper or nickel to the surface of the model, the metallic intermediate layer not being applied by thermal spraying, CVD, PVD or laser treatment;
   iii. Applying a metallic or ceramic coating onto the intermediate layer by thermal spraying; and
   iv. Removing the model from the intermediate layer.

2.) Process according to claim 1 characterised in the coating is backfilled after step iii or iv.

3.) Process according to one of claims 1 or 2 characterised in that the intermediate layer is removed after step iii or iv.

4.) Process according to one of the preceding claims characterised in that the coating exhibits an average thickness of at least 4 mm.

5.) Process according to one of the preceding claims characterised in that the coating exhibits a hardness of at least 35 HRC, in particular of more than 50 HRC.

6.) Process according to one of the preceding claims characterised in that the model consists of plastic, preferably of CRP, polyamide, polymer resin, polyethylene, polypropylene, PMMA, GRP, polyvinyl chloride, polystyrene, epoxy resin, polyether ether ketone, polyether imide, polycarbonate, polyphenyl sulphone, polyphenylene sulphide, polyarylamide, polyurea, NBR, SBR, polytetrafluoroethylene or phenol resin.

7.) Process according to one of claims 1 to 5 characterised in that the model is made of plastic, preferably by stereolithography, laminated object manufacturing (LOM) or laser sintering.

8.) Process according to one of claims 1 to 5 characterised in that the model is made of wood or paper.

9.) Process according to one of the preceding claims characterised in that the roughening of the surface of the model is carried out with a blasting agent, preferably with silicon carbide with the granulation P80.

10.) Process according to one of the preceding claims characterised in that the intermediate layer is coated with copper or nickel using a chemical process without electric current.

11.) Process according to claim 10 characterised in that a further metallic layer is applied onto the intermediate layer applied without electric current, in particular by an electrolytic process.

12.) Process according to one of the preceding claims characterised in that, onto the metallic layer deposited without electric current, a layer of aluminium, titanium or their alloys is applied whose surface is anodically oxidised or ceramics treated.

13.) Process according to claim 12 characterised in that one or several metallic layers are also arranged between the metallic layer deposited without electric current and the layer of aluminium, titanium or their alloys.

14.) Process according to claim 12 or 13 characterised in that the surface of the article is a ceramic oxide layer of aluminium, titanium or their alloys, which layer is coloured black by foreign ion embedments.

15.) Process according to one of the preceding claims characterised in that the model provided with the intermediate layer is positioned and fixed in a frame.

16.) Process according to claim 15 characterised in that the coating is filled or backfilled within the frame, in particular by thermal spraying or casting with an epoxy resin containing metal particles, if necessary, or with aluminium-containing foams.

17.) Process according to one of the preceding claims characterised in that an alloyed tool steel is applied by thermal spraying.

18.) Process according to one of the preceding claims characterised in that a spraying powder which preferably consists of 30-50 % by weight molybdenum powder 70-50 % by weight steel powder, in particular of 50 % by weight molybdenum powder and 50 % by weight steel powder is applied by thermal spraying.